DSIB01 Autumn 2021

01 Tooling

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Practicals overview

- Linux set-up
- Version Control Systems
- Git
- Markdown
- Coding Environment

- Hands-on example
- Project set-up

Linux set-up
VirtualBox

1. Get VirtualBox for Windows at

   https://www.virtualbox.org/wiki/Downloads

2. Download a pre-installed machine (DSIB_VM.ova) from

   https://drive.google.com/file/d/1DQYTS6YLkomvgGglu1ce5LAcLCAyx9AI/view?usp=sharing

3. Import the machine

4. Start & Log-in (usr: student, pswd: 1234)

Version Control System
Benefits

1. A complete long-term change history of every file

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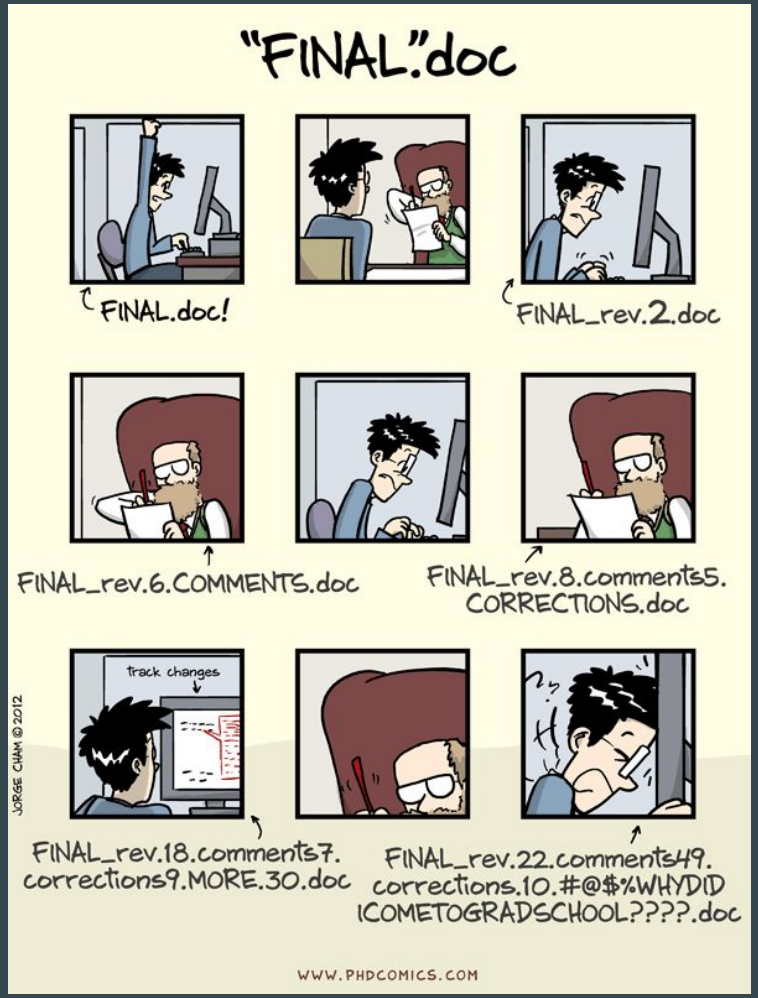
Benefits

1. A complete long-term change history
2. Enables recovery
3. Simplifies team work



Version Control System
Types

1. Local VCS
2. Centralized VCS
3. Distributed VCS

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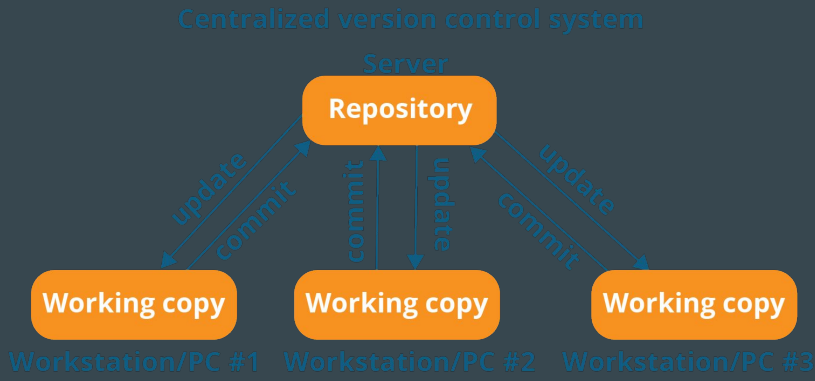
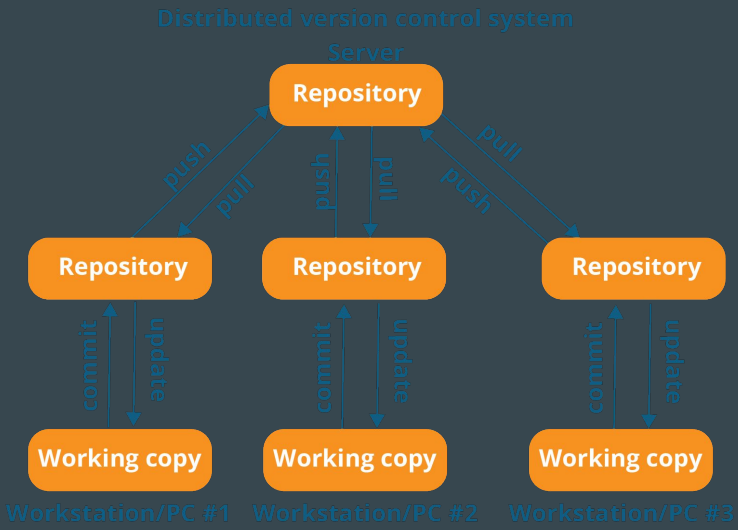


Version Control System
Types

1. Local VCS
2. Centralized VCS
3. **Distributed VCS**



Git
Repository

Anyone with a copy of the repo can:

- Check the history
- Clone
- Commit
- Branch
- Merge
- Compare changes
- ...

Working models:

- Fork and Pull
- Shared Repository

Git Hosting

GitLab

Codeberg

Git
Hosting

https://education.github.com/pack

Hands-on
1. Set-up Git

- Check Git availability on the machine, and if needed download Git from https://git-scm.com/downloads
- Choose a Git hosting page & set-up an account
- Fork the Demo repository at https://github.com/eliska-chalupova/DSIB01demo or create a repository with the same structure

Git
Windows

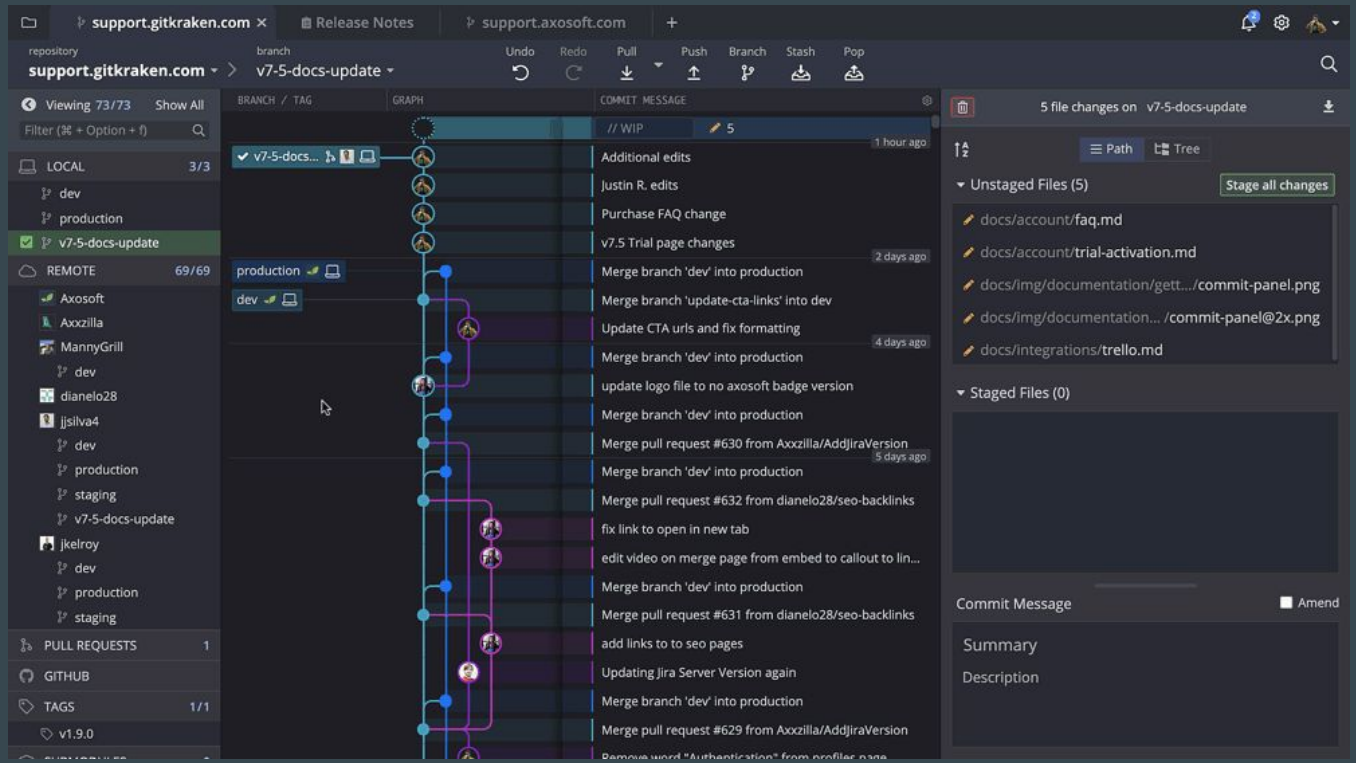
Git Bash

https://gitforwindows.org/

Git
GUI Clients

Client	Platform	Website
GitKraken	Linux, Mac, Windows	https://www.gitkraken.com/
SmartGit	Linux, Mac, Windows	https://www.syntevo.com/smartgit/
GitHub Desktop	Mac, Windows	https://desktop.github.com/
Sourcetree	Mac, Windows	https://www.sourcetreeapp.com/

Git
GUI Clients



Hands-on
2. GUI Client

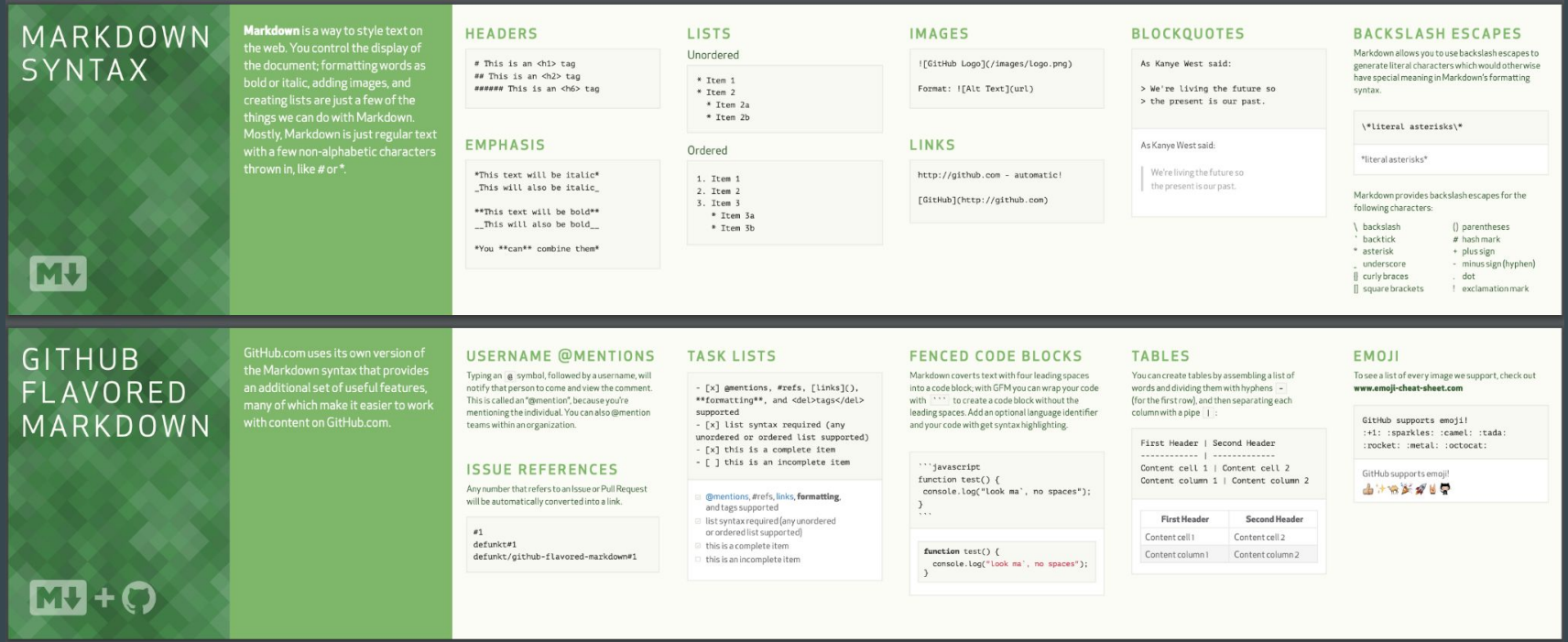
- Download and run a GUI client of Your choice
- Open Your repository
- Look around

Git
Good practices

- Create branches
- Make small commits
- Write meaningful commit messages
- Use pull requests
- Review and discuss code
- Rebase often

Markdown Briefly

"Markdown is a lightweight markup language for creating formatted text using a plain-text editor."



MARKDOWN SYNTAX

Markdown is a way to style text on the web. You control the display of the document; formatting words as bold or italic, adding images, and creating lists are just a few of the things we can do with Markdown. Mostly, Markdown is just regular text with a few non-alphabetic characters thrown in, like # or *.

HEADERS

```
# This is an <h1> tag
## This is an <h2> tag
###### This is an <h6> tag
```

EMPHASIS

```
*This text will be italic*
_This will also be italic_

**This text will be bold**
__This will also be bold__

*You **can** combine them*
```

LISTS

Unordered

```
* Item 1
* Item 2
  * Item 2a
  * Item 2b
```

Ordered

```
1. Item 1
2. Item 2
3. Item 3
   * Item 3a
   * Item 3b
```

IMAGES

```
![GitHub Logo](/images/logo.png)

Format: ![Alt Text](url)
```

LINKS

```
http://github.com - automatic!

[GitHub](http://github.com)
```

BLOCKQUOTES

```
As Kanye West said:

> We're living the future so
> the present is our past.
```

As Kanye West said:

> We're living the future so the present is our past.

BACKSLASH ESCAPES

Markdown allows you to use backslash escapes to generate literal characters which would otherwise have special meaning in Markdown's formatting syntax.

```
\*literal asterisks\*
```

literal asterisks

Markdown provides backslash escapes for the following characters:

\ backslash	() parentheses
` backtick	# hash mark
* asterisk	+ plus sign
_ underscore	- minus sign (hyphen)
{} curly braces	. dot
[] square brackets	! exclamation mark

GITHUB FLAVORED MARKDOWN

GitHub.com uses its own version of the Markdown syntax that provides an additional set of useful features, many of which make it easier to work with content on GitHub.com.

USERNAME @MENTIONS

Typing an `@` symbol, followed by a username, will notify that person to come and view the comment. This is called an "@mention", because you're mentioning the individual. You can also @mention teams within an organization.

ISSUE REFERENCES

Any number that refers to an Issue or Pull Request will be automatically converted into a link.

```
#1
defunkt#1
defunkt/github-flavored-markdown#1
```

TASK LISTS

```
- [x] @mentions, #refs, [links](), **formatting**, and <del>tags</del> supported
- [x] list syntax required (any unordered or ordered list supported)
- [x] this is a complete item
- [ ] this is an incomplete item
```

- [x] @mentions, #refs, links, **formatting**, and tags supported
- [x] list syntax required (any unordered or ordered list supported)
- [x] this is a complete item
- [ ] this is an incomplete item

FENCED CODE BLOCKS

Markdown coverts text with four leading spaces into a code block; with GFM you can wrap your code with ``` to create a code block without the leading spaces. Add an optional language identifier and your code with get syntax highlighting.

````
```javascript
function test() {
  console.log("look ma', no spaces");
}
```
````

```javascript
function test() {
  console.log("look ma', no spaces");
}
```

TABLES

You can create tables by assembling a list of words and dividing them with hyphens `-` (for the first row), and then separating each column with a pipe `|`:

```
First Header | Second Header
------------ | -------------
Content cell 1 | Content cell 2
Content column 1 | Content column 2
```

First Header	Second Header
Content cell 1	Content cell 2
Content column 1	Content column 2

EMOJI

To see a list of every image we support, check out **www.emoji-cheat-sheet.com**

```
GitHub supports emoji!
:+1: :sparkles: :camel: :tada:
:rocket: :metal: :octocat:
```

GitHub supports emoji!

👍✨🐪🎉🚀🤘

Hands-on
3. Markdown

- Write a text in Your Project Report / README file
- Use elements of the Markdown syntax

Coding Environment
Code Editor vs IDE

IntelliJ IDEA

Visual Studio

Xcode

eclipse

Apache NetBeans IDE

IDE vs Code Editor

Comparison Chart

IDE	Code Editor
An IDE is a set of software development tools designed to make coding easier.	Code editor is a developer's tool designed to edit the source code of computer programs.
It consolidates many of the functions like code creation, building and testing, together in a single framework service or application.	It is a text editor with powerful built-in features and specialized functionalities to simplify and accelerate code editing process.
Key features include text editing, compiling, debugging, GUI, syntax highlighting, unit testing, code completion, and more.	Key features include syntax highlighting, printing, multiview, and preview window.
Some popular IDEs are Eclipse, IntelliJ IDEA, Visual Studio, NetBeans, etc.	Some common code editors include Atom, Sublime Text, Brackets, Visual Studio Code, etc.

DifferenceBetween.net

Sublime Text

ATOM

Visual Studio Code

Brackets

Notepad++

the editor

Coding Environment
Free Code Editors

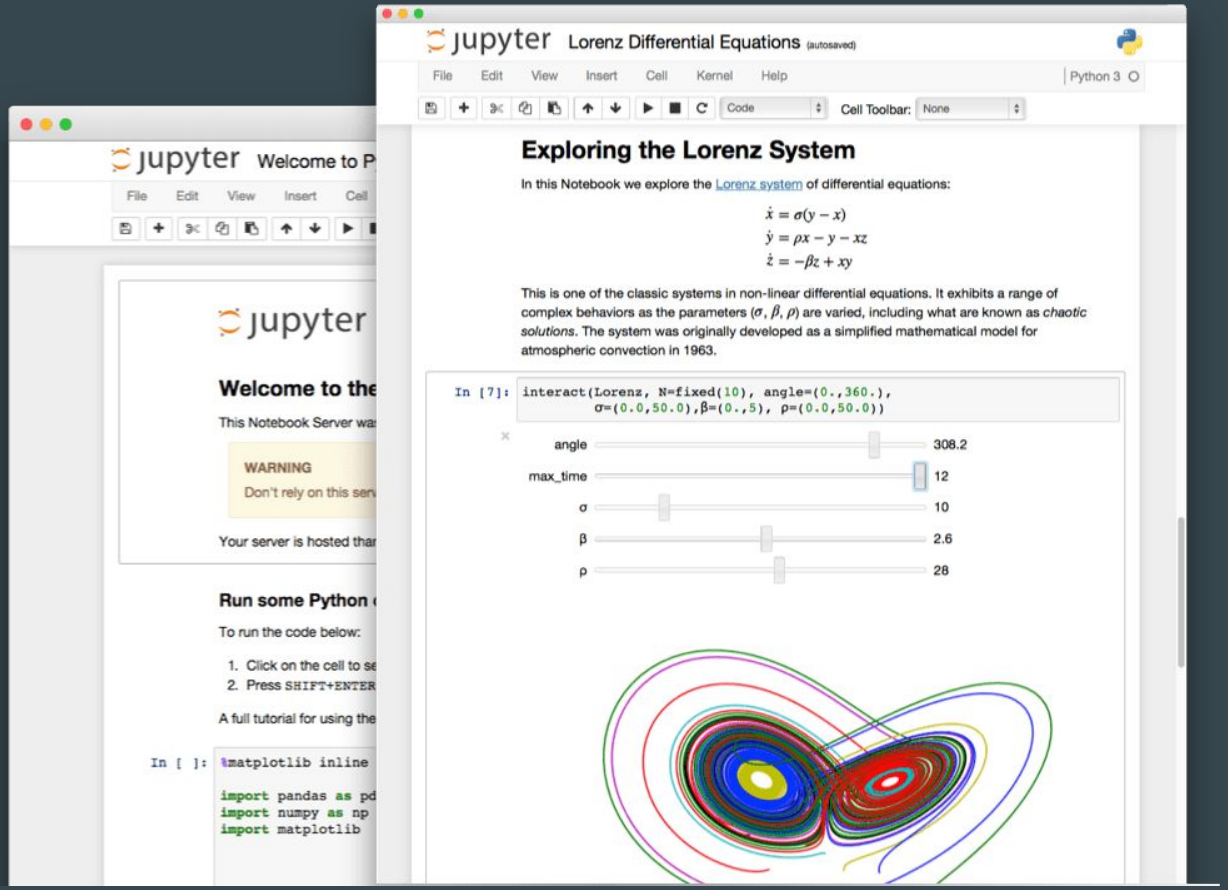
Code Editor	Platform	Website
ATOM	Linux, Mac, Windows	https://atom.io/
Visual Studio Code	Linux, Mac, Windows	https://code.visualstudio.com/
Notepad++	Windows	https://notepad-plus-plus.org/
the editor	Linux	https://www.vim.org/

Coding Environment
Free IDEs

IDE	Platform	Website
	Linux, Mac, Windows	https://www.jetbrains.com/shop/eform/students
	Mac, Windows	https://visualstudio.microsoft.com/vs/community/
	Linux, Mac, Windows	https://netbeans.apache.org//
	Linux	https://www.eclipse.org/eclipseide/

Coding Environment
Jupyter Notebook

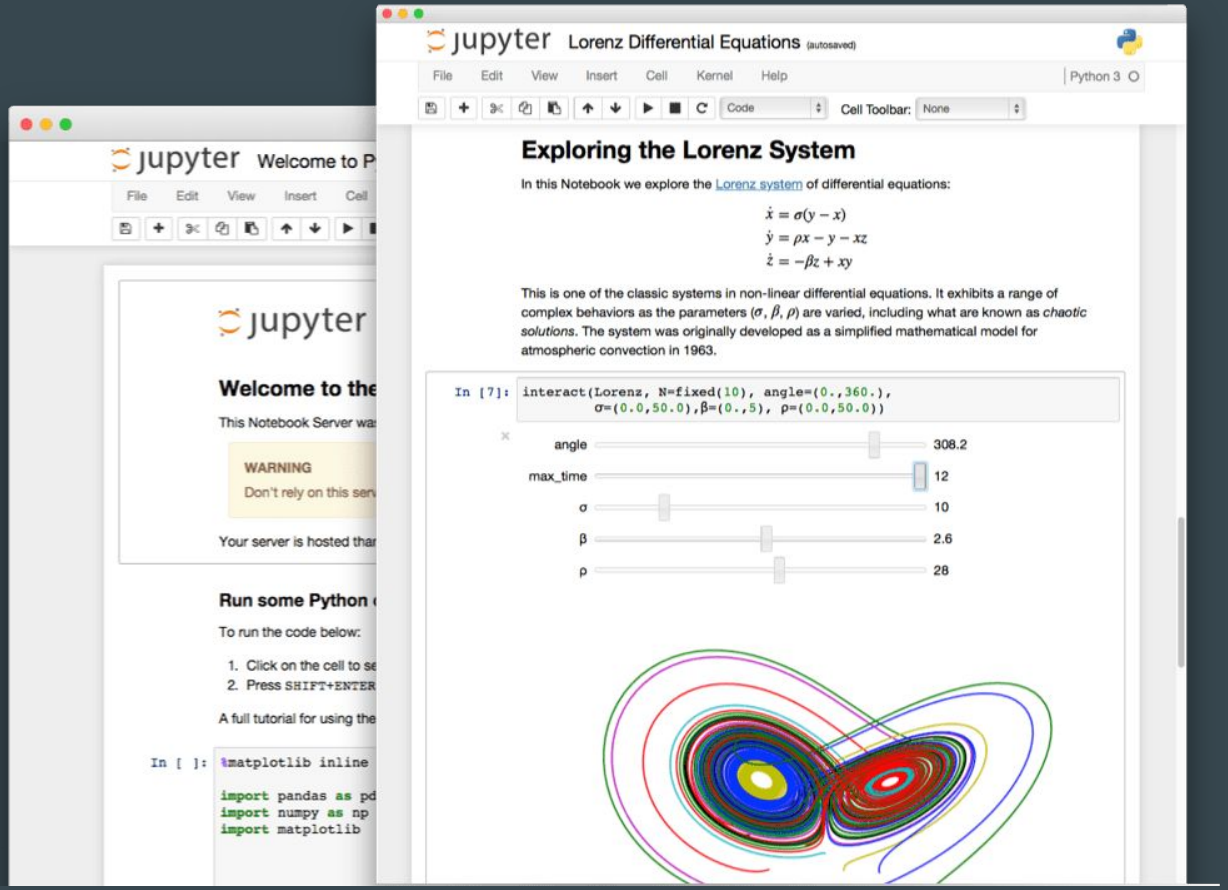
"The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text."



Coding Environment
Jupyter Notebook

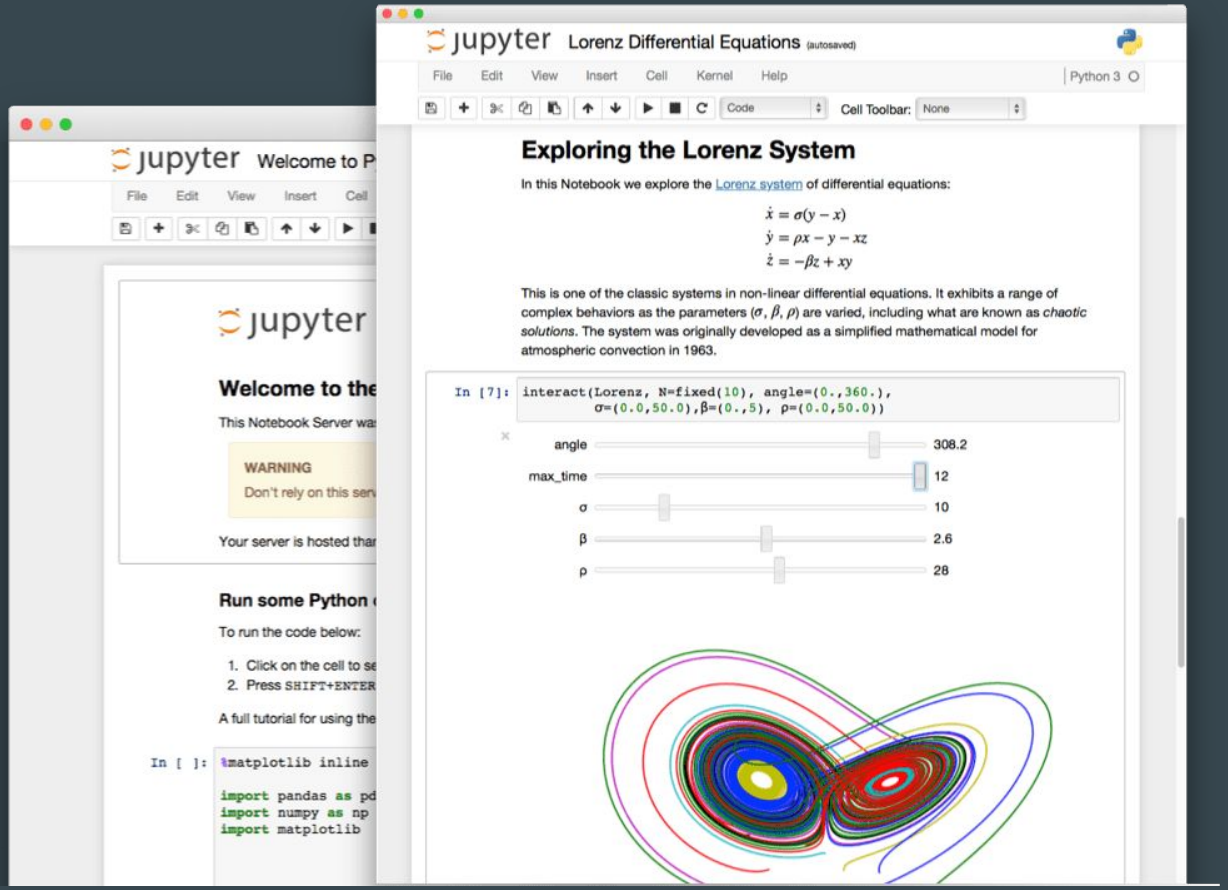
Uses include:

- data cleaning and transformation,
- numerical simulation,
- statistical modeling,
- data visualization,
- machine learning, and much more.



Coding Environment
Jupyter Notebook

https://jupyter.org/try



Hands-on
4. Environment

- Get a Code Editor or IDE of Your choice
- Open the repository / selected file
- Make changes in one of the files in the /demo folder
- Push the changes to Your remote repository

Hands-on
5. Play with Git

Try out diverse Git commands:

- Create a local / remote branch
- Commit
- Check status
- Create stash
- Push
- Merge two branches
- Add a tag
- ...

Project
Set-up

- Set up an account on a Git-hosting site
- Create a repository with the structure as in https://github.com/eliska-chalupova/DSIB01demo
- The repository will be used for all the materials for Your project throughout the course
- Use the README file to write Your project report
- Write & discuss all the results throughout the course in the project report
- You will present Your project at the colloquium by the end of semester

Questions ?

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